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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,550	12/14/2001	Wha Seop Lee	MR2685-105	3295
4586	7590	04/22/2004	EXAMINER	
ROSENBERG, KLEIN & LEE 3458 ELLICOTT CENTER DRIVE-SUITE 101 ELLICOTT CITY, MD 21043			OCAMPO, MARIANNE S	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/014,550

Applicant(s)

LEE ET AL.

Examiner

Marianne S. Ocampo

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Information Disclosure Statement*

1. **The listing of references in the specification is not a proper information disclosure statement.** 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered. The following references have been cited in the specification, third page in the last paragraph thereof, but no copy of the cited references have not been submitted and therefore not been considered by the examiner. They are :

a). *"Electrospinning Process and Applications for Electrospun Fibers" by Doshi and Reneker (J. Electrostatics, 35, 151-160 (1995))*

b). *"Beaded nanofibers formed during electrospinning" by H. Fong (Polymer, 40, 4585-4592 (1999))*

c). *"Transparent Nanocomposites with Ultrathin, Electrospun Nylon-4,6 Fiber Reinforcement" by Michel M. Bergshoeff et al. (Adv. Mater., 11, 16, 1362-1365 (1999)).*

If applicants wish to have these references considered, copies of the references must be submitted in the form of an IDS, in the response to this office action.

***Withdrawal of Previously Indicated Allowable Subject Matter***

2. The indicated allowability of original claim 11, whose subject matter is now incorporated into amended base claim 1, is hereby withdrawn in view of the newly discovered references to Simm et al. (US 4,069,026) and Fine et al. (US 4,223,101). Rejections based on the newly cited references follow.

***Specification***

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the claimed limitation "*compulsorily discharging air containing a large amount of solvent externally while injecting air into a working space during electrospinning*" lacks proper antecedent basis in the specification.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1723

5. Claims 1 – 10 and 12 – 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a). Particularly in claim 1, the terms "a **large amount** of solvent" in line 6 and "forming a **thin** fiber-structured polymer web" in line 8 (those terms highlighted) are considered relative terms which renders the claim indefinite. The terms "large amount" and "thin" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. With regards to the limitation "a large amount of solvent", the value of what "a large amount of solvent" has not been defined in the specification and likewise, it is unclear what value of the thickness is considered by the applicants to be a "thin fiber-structured polymer web".

b). Claims 2 – 10 and 12 – 13 are dependent claims of claim 1 and therefore, they also suffer the same defects since they depend therefrom.

### *Claim Rejections - 35 USC § 102*

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 – 2, 4, 6 – 7, 10 and 12 - 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Simm et al. (US 4,069,026).

8. With respect to claim 1, Simm et al. disclose a method for preparing a thin fiber-structure polymer web (4) comprising the steps of :

- dissolving a polymer in a volatile solvent used as a polymer solvent to prepare a polymer solution;
- spinning the polymer solution by electrospinning (i.e. electrostatic spinning process);
- compulsorily discharging (i.e. venting) air containing a large amount of solvent (evaporated solvent) externally (via an exhaust vent 10) while injecting air into a working space (by spraying/created in a spray chamber 9) during the electrospinning; and
- forming a thin fiber-structured web (4) cumulated on a collector (2, 5), as in fig. 1 and cols. 1 – 4.

9. Concerning claim 2, Simm et al. have disclosed the limitations of claim 1 above. Simm et al. further disclose the volatile solvent being at least one having high volatility in the form of methylene chloride or chloroform, as in col. 2, lines 14 – 16 and in claims 9 – 10 in col. 6.

10. With respect to claim 4, the limitation "the relative humidity" lacks proper antecedent basis in this claim. Simm et al. have disclosed the limitations of claim 1 above. Simm et al. also disclose the relative humidity in the working space for electrospinning being less than 40%, which includes those values in claimed range of 0 to 40%, as in col. 2, lines 50 – 51.

11. Regarding claim 6, Simm et al. have disclosed the limitations of claim 1 above. Simm et al. further disclose the content of the polymer used in the preparation of the polymer solution is within the claimed range of 0.1 to 40 wt% based on the content of the solvent, as in examples 1 – 3.

12. Concerning claim 7, Simm et al. have disclosed the limitations of claim 1 above. Simm et al. also disclose the polymer may be selected from polystyrene, polyacrylonitrile, cellulose esters (which include cellulose acetates) or polycarbonate, as in col. 2, lines 11 – 14 and examples 1 – 3.

13. With regards to claim 10, Simm et al. have disclosed the limitations of claim 1 above. Simm et al. further disclose the collector (5) having its upper part provided with a filtering medium in the form of a gas permeable support layer (i.e. cellulose fleeces), as in col. 3, lines 9 – 11 and example 1.

Art Unit: 1723

14. With respect to claim 12, Simm et al. disclose a thin (having a thickness of at least less than 1  $\mu\text{m}$ ) fiber-structured polymer web (4, fibre filter in examples 1 - 3) obtained by the method of claim 1, as in fig. 1 and in cols. 1 - 4.

15. Concerning claim 13, Simm et al. disclose a filter (20, 21) obtained by laminating the thin fiber-structured polymer web (4) manufactured by the method of claim 1, as in figs. 1 & 4 and in cols. 1 - 4.

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 5 and 8 - 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simm et al. (026).

18. Regarding claim 5, Simm et al. have disclosed the limitations of claim 1 above. Although Simm et al. do not teach the temperature of the polymer solution being in the range of

40 degrees Celsius to the boiling point of the solvent, it is considered obvious to one of ordinary skill in the art that the temperature of the polymer solution can be modified and optimized in order to achieve the thin/thickness desired by the manufacturer of the polymer web, and is dependent upon desired thickness (i.e. thin values) of the resulting fibre web/filter product. The values of the temperature of 40 degrees Celsius to the boiling point of the solvent, are considered to be optimum values of a result effective variable in a known process, in this instance, in providing the desired "thin fiber-structured polymer web". The case law, **In re Boesch**, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) has stated:

"The discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art, and thus a prima facie case of obviousness is established."

19. With respect to claim 8, Simm et al. have disclosed the limitations of claim 7 above. Simm et al. further disclose the polymer may be mixed with an organic salt, which could be in the form of a powdered substance or in liquid form, to increase the conductivity of the polymer solution, thereby allowing the thickness of fibers of the fiber-structured web to be adjusted (i.e. to form thinner fibers) accordingly, as in col. 2, lines 33 – 45. The case law, **In re Dailey**, 357 F.2d 669, 149 USPQ 47 (CCPA 1966), provided (The court held) that the configuration (i.e. form being a powdered substance or a liquid) of the claimed invention, which in this instance, the organic salt to be mixed with the polymer, was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration/form of the claimed invention was significant.

20. With regards to claim 9, Simm et al. have disclosed the limitations of claim 1 above. Simm et al. also disclose the collector (2, 5) being an electrode, which could be an anode or cathode (i.e. a positive charged electrode), as in cols. 2 – 4. Although Simm et al. do not teach specifically what type of material to form the anode or cathode collector, it is considered by one of ordinary skill in the art to modify the anode or cathode collector to a particular/specific type (in this instance a cathode formed of a carbon material, tin oxide or lithium compounds, etc.) as an obvious modification as merely a choice material for the cathode collector. The case law *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) stated that a prima case of obviousness exists in a selection of (a known plastic, or) in this instance, a cathode collector made of a carbon material, tin oxide or one of those materials claimed by the invention in claim 9, to make a (container) in this instance, a positive/cathode collector of a type made of (plastics) in this case, cathode/positive materials prior to the invention.

21. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simm et al. in view of Fine et al. (US 4,223,101).

22. Concerning claim 3, Simm et al. have disclosed the limitations of claim 1 above. Simm et al. fail to disclose the solvent being a mixed solvent comprising at least one relatively high-volatility solvent and at least one relatively low-volatility solvent as recited in this claim.

23. Fine et al. teach a similar method for preparing a thin fiber-structured polymer web similar to Simm et al., the method of Fine et al. including dissolving a polymer (such as polyurethane) in a volatile solvent, spinning the polymer solution by electrospinning and forming a thin fiber-structured polymer web cumulated on a collector, wherein the volatile solvent could be a mixed solvent of at least one relatively high-volatility solvent in the form of tetrahydrofuran and at least one relatively low-volatility solvent in the form of a N-N-dimethylformamide, as in cols. 1 – 8.

It is considered obvious to one of ordinary skill in the art at the time of the invention to modify the method of Simm et al. by substituting the volatile solvent used in the method of Simm et al., in lieu of the mixed solvent taught by Fine et al., in order to provide an alternative volatile solvent which can be more readily available, or provide a solvent which is less volatile, thereby making the method of manufacturing the polymer web be operable/can be performed at conditions of high relative humidity, and depending upon the solubility of the polymer used in making the polymer web (see cols. 5 – 6 of Fine et al.).

#### ***Response to Arguments and Amendments***

24. Applicant's arguments with respect to claims 1 – 10 and 12 - 13 have been considered but are moot in view of the new grounds of rejection set forth above. The examiner greatly appreciates applicants' effort to advance prosecution by amending the claims by incorporating previously indicated allowable subject matter into the base claim. However, after

Art Unit: 1723

performing an updated search, the newly cited references used in the rejections above, have been found.

**25. This action is non-final.**

***Conclusion***

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 4,143,196 (Simm et al.) and US Patent Application Publication 2003/0201579 A1 to Gordon et al.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne S. Ocampo whose telephone number is (571) 272-1144. The examiner can normally be reached on Mondays to Fridays from 8:30 A.M. to 4:30 P.M..

28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1723

29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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